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Investigation of a Cluster of Syphilis, Gonorrhea, and Chlamydia Cases Among Heterosexual Micronesians Living on Oahu

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Abstract A recent case investigation of secondary syphilis in a 27-year-old heterosexual Micronesian male and his 19-year-old chlamydia and syphilis co-infected female partner, conducted by the Hawaii State Department of Health, June to August 2007, identified a cluster of 13 case-patients with undiagnosed syphilis, chlamydia, and gonorrhea. The social network of Micronesians uncovered was characterized by having transient accommodations but a central gathering place. The critical factor in gaining access to this network was the establishment of a trusting relationship with a key social network member. Field interviews and the application of field diagnostic techniques helped to identify case-patients who otherwise would not have presented to a traditional office or clinic setting. Micronesians in Hawaii represent an at-risk population for adverse health indices including sexually transmitted diseases, based on their socioeconomic status.

Keywords Outbreak investigation · Sexually transmitted diseases · Oceanic ancestry group · Hawaii

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Introduction

Rates of primary and secondary syphilis in the United States have decreased throughout the 1990s and reached an all time low of 2.1 cases per 100,000 in 2000. However, rates have increased every year since 2001. Currently, males outnumber females by approximately 6:1. The majority of male cases have been men who have sex with men (MSM) and have been characterized by high risk sexual behaviors and high rates of HIV-co-infection. The highest age-specific rates have been among men ages 35–39 years. Gonorrhea and chlamydia have impacted younger heterosexuals, and rates of both infections have also increased in recent years [1].

Ethnic disparities in sexually transmitted disease (STD) occurrence are well recognized nationally, with Blacks, Hispanics, and American Indian/Alaskan Natives demonstrating higher rates of reported syphilis, gonorrhea, and chlamydia than Whites, while the aggregate "Asian/Pacific Islanders" subgroup population has consistently had the lowest rates of reported STDs [1].

In some ways, STD trends in Hawaii mirror those of the mainland United States. Primary and secondary syphilis cases also declined in the 1990s. Rates have recently increased, but have remained below 1.5 cases per 100,000 since 1996 [2–4]. Over the past 5 years, 96% of primary and secondary syphilis cases have been among males with a median age of 42 years. Eighty percent of case-patients have reported MSM risk behavior, and when interviewed, 38% self-disclosed that they were co-infected with HIV. Blacks have been overrepresented among reported syphilis, gonorrhea, and chlamydia cases, while Asian/Pacific Islanders have demonstrated rates below Whites for syphilis but comparable to Whites with respect to gonorrhea and chlamydia (Hawaii State Department of Health, unpublished data).

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A recent case investigation of secondary syphilis in a young (27-year-old) heterosexual Micronesian male and his 19-year-old chlamydia and syphilis co-infected female partner identified a cluster of case-patients with undiagnosed STDs and provided a disease intervention challenge for Hawaii State Department of Health (HDOH) STD disease intervention specialists.

Initial Case Report

In June 2007, a 27-year-old Micronesian male (patient A) presented to a hospital emergency department (ED) in Honolulu, Hawaii with perianal condyloma lata. Serological tests for syphilis revealed a positive fluorescent treponemal antibody absorbed test (FTA-ABS) and reactive Venereal Disease Research Laboratory test (VDRL) with a titer of 1:128. The patient was treated with benzathine penicillin G, 2.4 mU IM, and the HDOH was contacted for disease intervention/partner notification services. Patient A was noted to be homeless and had been brought to the ED by ambulance.

Initial Case Investigation

The telephone number patient A used to contact the ambulance was a pay phone, his listed employment location was invalid; however, a valid cell phone number was provided. Initial contact by cell phone was unsuccessful. The female cell phone owner, who answered, denied knowledge of patient A. Although she understood English, a HDOH translator was utilized in an attempt to optimize communications. After the purpose of the call was explained, the cell phone owner admitted that patient A was a friend and that she was aware of his location. She contacted the HDOH and arranged for patient A and his current partner to be seen at the HDOH STD clinic.

Upon presentation at the HDOH STD clinic, patient A was screened for gonorrhea and chlamydia, interviewed, and retreated with benzathine penicillin G, 2.4 mU IM, as a probable syphilis reexposure. He named three partners in the preceding 6 months (patients B, C, and D). Patient A was found to be positive for chlamydia based on a nucleic acid amplification test (NAAT) performed during his clinic visit and was subsequently treated with azithromycin 1 g orally.

His current female partner (patient B), a 19-year-old Micronesian female, accompanied him to the clinic and was examined and tested for syphilis, chlamydia, and gonorrhea. She had no history compatible with recent syphilis infection. Her syphilis serology revealed a positive FTA-ABS with a VDRL titer of 1:64. She was also found to be positive for chlamydia by NAAT. On interview, patient B identified one additional male contact (patient E). Based on her serology and age she was diagnosed as latent syphilis of unknown duration and treated with three weekly IM injections of benzathine penicillin G, 2.4 mU. She was also treated with one gram azithromycin orally for chlamydia.

Living accommodations for patients A and B and their partners were noted to be transient in nature, but a specific public park location served as a common gathering place. The cell phone owner was an informal group leader. Once a trusting relationship was established with her, she helped to arrange and facilitate clinic visits and field investigations including interviews and screening by HDOH STD disease intervention specialists (DIS) at the common gathering place.

Cluster Investigation Results

Patient C, a 21-year-old Micronesian female, was screened for syphilis in the field. Since she was named by patient A as a recent sexual partner, DIS referred her to the clinic as a contact to syphilis and chlamydia for further evaluation and treatment. Patient C presented to the clinic with no symptoms. She was examined and screened for chlamydia and gonorrhea. On the date of her initial visit, she was treated epidemiologically with benzathine penicillin G, 2.4 mU IM, and one gram azithromycin orally. She subsequently demonstrated a negative serology for syphilis and NAAT for chlamydia, but her gonorrhea NAAT was positive. She was treated in the field with 400 mg oral cefpodixime. She named one additional male sexual partner, patient F, but had no locating information for him.

Since all three patients had either chlamydia or gonorrhea infections, DIS offered field chlamydia and gonorrhea screening using urine-based NAATs.

Thirty-four additional persons were serologically tested for syphilis in the field; five were serologically positive (three males and two females). Each had positive FTA-ABS; three had low titer rapid plasma reagin (RPR) or VDRL results (1:1 or 1:2) and two had nonreactive RPR or VDRL results. All were subsequently located, informed of their results, and offered transportation to the HDOH STD clinic for treatment. Four of the five denied syphilis in the past, and none acknowledged having had symptoms compatible with syphilis. One female patient who was pregnant had been diagnosed with late latent syphilis as part of her prenatal screening. Her treatment had been initiated on two separate occasions, but never completed. She was extensively counseled and made an appointment to initiate a third benzathine penicillin series with her private obstetrician, but did not show up to her appointment.

Table 1 Hawaii State Department of Health STD cluster investigation, June–August 2007

Type of test	Total number of tests performed		Positive test results
	Field	Clinic	Number (%)
Syphilis serology	35	4[a]	7 (18)
Gonorrhea NAAT	17	5	4 (18)
Chlamydia NAAT	17	5	6 (27)

[a] Includes serological testing of index case in the emergency department

Table 2 Hawaii State Department of Health STD cluster investigation, June–August 2007

STD diagnosis	Number of case-patients	Number treated
Syphilis only	5	1
Syphilis plus chlamydia	2	2
Chlamydia only	2	2
Gonorrhea plus chlamydia	2	1
Gonorrhea only	2	1

In total, 39 persons were tested for syphilis (the index case plus 35 persons in the field and three persons in the clinic). Seven case-patients were identified (four males and three females) of whom three received treatment despite three field visits over 11 weeks (Tables 1, 2).

Twenty-two persons were tested for chlamydia and gonorrhea (17 in the field using urine-based NAATs and five in the clinic). Eight case-patients were identified: two with chlamydia only (both treated), two with chlamydia and gonorrhea (one treated, the other was not locatable), two with gonorrhea only (one treated, the other was informed but refused treatment), and two co-infected with syphilis and chlamydia (both treated; Tables 1, 2). Oral therapy with azithromycin (1 g) and cefpodoxime (400 mg) were administered to field treat positive chlamydia and gonorrhea cases, respectively.

Patients D, E, and F have yet to be located; the latter two are believed to have left Hawaii.

Discussion

Syphilis cases and outbreaks occurring in the United States have predominately involved men who have sex with men and have been associated with both high-risk sexual behavior and HIV co-infection [5]. Although there have been reports of heterosexual syphilis clusters on the mainland US involving ethnic minority populations, including itinerant workers [6–8], this was the first such heterosexual syphilis cluster identified in the state of Hawaii, and the first in the US of which we are aware, involving young Micronesian immigrants.

Although the US Centers for Disease Control and Prevention (CDC) has aggregated Asians and Pacific Islanders (including Micronesians) into a single ethnic group for disease reporting purposes, there is much diversity within this category. Relatively little information is available on STD risk factors among members of this diverse population group [9].

While ethnic disparities in STD occurrence are well recognized, it is important to note that race and ethnicity are "risk markers that correlate with other more fundamental determinants of health status such as poverty, access to quality health care, health care seeking behavior, illicit drug use, and living in communities with high prevalence of STDs" [1]. In this regard, Micronesian immigrants in Hawaii share similar adverse health determinants with mainland US ethnic minorities. According to the 2000 US Census, over 40% of Micronesians in Hawaii are living at or below the federal poverty level [10].

The transient residential status of our study population coupled with language barriers, limited phone access, unemployment, restricted access to medical care based on lack of insurance and no identified health care provider, and reliance on public transportation added to the challenge of STD screening and provision of treatment.

In addition to partner notification, the identification of sexual and social networks is considered essential to the investigation and control of STD outbreaks [11, 12]. The establishment of a trusting relationship with a key member of this social network facilitated the investigational process. Building upon that trust with individual community members allowed for multiple field visits for screening and treatment to occur.

Once this "at-risk" population was identified and a relationship was established with members of the community, STD disease intervention specialists were able to collaborate with other DOH program personnel to help facilitate screening for other health-related problems known to impact Micronesians, including Hansen's disease and hepatitis B.

Application of field diagnostic testing including urine-based NAATs and phlebotomies helped optimize identification of STDs among this difficult to access population. These strategies have been successfully employed for other difficult to reach populations such as injection drug users [13].

The importance of establishing rapport and trust with clients is paramount. Field investigations, including field application of diagnostic techniques may be necessary to identify infected persons who otherwise might not present to a traditional office/clinic setting.

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